

DETAILED ACTION

Claim Objections

Claim 1 is objected to because of the following informalities: In line 3, "exterior components which has" should be changed to ---exterior components which have---.

Claim 1 is objected to because of the following informalities: In line 4, "in which plural" should be changed to ---in which a plurality of---.

Claim 1 is objected to because of the following informalities: The claim should positively recite the method steps. In lines 4-5, the insertion/coupling step may be recited as --inserting vulnerable portions between the plurality of exterior components--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is meant by "plural exterior component original shapes" and "vulnerable portions are inserted are coupled", found in lines 4-5 of Claim 1.

Are the vulnerable portions of the components coupled to the components or are they inserted? Also, how are they inserted or coupled. It seems that the vulnerable portions

are formed during casting, which is claimed in dependent claim 3, yet Claim 1 appears to be reciting that the vulnerable portions are separately formed from the casting. Also, what is meant by component original shape? Is this limitation attempting to recite that the casting forms the final shape of the component, or that the casting an initial form separate from end product? It appears that the casting produces the final end product of the workpiece, but it is not explicitly recited and the claim is indefinite because it is unclear what exactly the casting process produces.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura et al (JP 03-015609) in view of Kuroda (JP 09-256819) in view of Wright (5,201,117).

1. Nomura et al teach a method for assembling a cam shaft comprising:
forming a plurality of cam lobe members by cutting a solid rod into a cam profile and drilling the cam piece to form a central hole for insertion of the camshaft (see *Abstract*).

Nomura et al fail to teach casting the cam lobe members, forming a vulnerable portion between the members and dividing by breaking along the vulnerable portion.

Kuroda teach casting cam lobe members (see [0008]).

Wright teaches forming a vulnerable portion along the leading edge of a component and dividing individual components by breaking along the vulnerable portion (see *Figures 2a-2c and 3 and column 1 lines 55-65*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the solid rod of Nomura et al by casting, as taught by Kuroda, because it improves dimensional accuracy of the cam and allows the cam to be formed with its final shape without cutting, thereby reducing manufacturing costs (see *Kuroda [0009]*).

Furthermore, it would have been obvious to form a vulnerable portion onto the rod of Nomura et al and to divide at the vulnerable portion, as taught by Wright, because it

separates the cam members to the desired lengths without forming debris (see *column 1 lines 42-45*).

6. Nomura et al/Kuroda/Wright teach the method of claim 1, further comprising cutting a shaft hole into the cam member (see *Nomura et al Abstract*).

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura et al (JP 03-015609) in view of Kuroda (JP 09-256819) in view of Wright (5,201,117) as applied to claim 1 above, further in view of McDonald (5,122,204).

2 and 4. Nomura et al/Kuroda/Wright teach the method of claim 1, but fail to teach wherein the exterior components are chilled by a plurality of chillers which rapidly remove heat after the molten metal is injected.

McDonald teaches a casting mold for producing camshafts wherein a plurality of chill inserts are provided to remove heat from the product (see *column 3 lines 64-68 – column 4 lines 1-8*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide chill inserts onto the mould of Nomura et al because it produces a product that is more homogeneous and has better mechanical properties (see *McDonald column 3 lines 1-2*).

Allowable Subject Matter

Claims 3 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER P. TAOUSAKIS whose telephone number is (571)272-3497. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Alexander P Taousakis
Examiner
Art Unit 3726

/Alexander P Taousakis/
Examiner, Art Unit 3726

/DAVID P. BRYANT/
Supervisory Patent Examiner, Art Unit 3726